Canadian Institute for International Peace and Security

Institut canadien pour la paix et la sécurité internationales

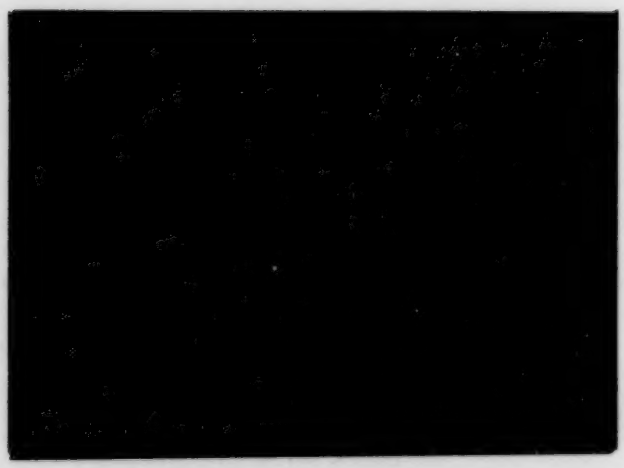
WORKING PAPER 39

Arms Export Controls to Limit Weapons Proliferation

Summary of an international conference
held in Ottawa
19, 20, and 21 June 1991

by
Jean-François Rioux

December 1991



92-04892/

WORKING PAPER 39

Arms Export Controls to Limit Weapons Proliferation

Summary of an international conference
held in Ottawa
19, 20, and 21 June 1991

by
Jean-François Rioux

December 1991

CANADIAN CATALOGUING IN PUBLICATION DATA

Rioux, Jean-François, 1958 -

Arms export controls to limit weapons proliferation: Summary of an international conference organized by the Canadian Institute for International Peace and Security in Ottawa on June 19, 20 and 21, 1991.

(Working paper; n° 39)

Issued also in French under title: La limitation de la prolifération des armements par le contrôle des exportations.

ISBN 0-662-19329-6
DSS cat. no. CC293-5/39

1. Arms control -- Congresses. 2. Arms race -- Congresses. 3. Nuclear nonproliferation -- Congresses. 4. Armed Forces -- Procurement -- Congresses. I. Canadian Institute for International Peace and Security. II. Title. III. Series: Working paper (Canadian Institute for International Peace and Security) ; nº 39.

JX1974.R56 1992 327.1'74 092-099560-8

For more copies, please write:

360 Albert Street, Suite 900
Ottawa, Ontario
K1R 7X7

PREFACE

Working Papers, the result of research work in progress or the summary of a conference, are often intended for later publication by the Institute or another publisher, and are regarded by the Institute to be of immediate value for distribution in limited numbers -- mostly to specialists in the field.

The opinions contained in the papers are those of the participants and do not necessarily represent the views of the Institute and its Board of Directors.

Jean-François Rioux is a Research Fellow at the Canadian Institute for International Peace and Security.

TABLE OF CONTENTS

INTRODUCTION. 1

I CURRENT TRENDS 4

The Proliferation of Arms in the 1990s 4
New Arms Producers and Dual-Purpose Technologies 8

II CONVENTIONAL WEAPONS 12

Trends in Production and Trade 12
Strengthening Export Controls 14

III NUCLEAR WEAPONS 19

Trends in the Proliferation of Nuclear Weapons 19
Controlling Nuclear Exports 24

IV OTHER WEAPONS OF MASS DESTRUCTION 31

Chemical Weapons 31
Biological Weapons 35

V COMMAND AND LAUNCH SYSTEMS 39

Intermediate-Range and Intercontinental Missiles 39
C^3I Systems 44

CONCLUSION 47

APPENDICES

A Summary of the Addresses Closing the Conference 51
B Conference Programme 56
C List of Participants 59
D List of Acronyms 64

INTRODUCTION

The end of the Cold War and Iraq's invasion of Kuwait have highlighted the problem posed by horizontal arms proliferation. Some think that the decline of the ideological and political blocks has made regional powers freer to pursue their expansionist dreams through the acquisition of modern arsenals, the centrepiece of which is a capacity for mass destruction. In this view, Saddam Hussein's Iraq is the prototype of what awaits the world. Ensuing events have shown that the great powers take this question very seriously: the Security Council authorized sanctions, military intervention, and the partial disarmament of Iraq. There are of course critics of the UN action in Iraq, for a variety of reasons. However, no one can deny that the war had certain positive consequences, in particular a heightened awareness of the dangers posed by arms proliferation and excessive military power.

It was especially disturbing to realize that Iraq had purchased one of the most potent arsenals in the Third World without much difficulty. Saddam Hussein was able to acquire chemical and biological weapons despite the prohibitions against them. He also began to develop nuclear weapons, regardless of his country's solemn undertakings when it signed the nuclear Non-Proliferation Treaty (NPT). In short, the industrialized countries provided him, whether intentionally or not, with the technology he needed to pose a menace to regional security.

The industrialized countries seem, however, to have realized the error of their ways in the meantime and have taken steps to prevent a repetition. Several initiatives have been announced to place further controls on the export of arms and sophisticated technologies. Countries such as Germany, which, as we now know, helped Iraq create its potential for mass destruction, have undertaken to tighten their export controls. Italy has adopted new legislation on weapons sales, and in the nuclear area, the United States has requested that a new list of dual-purpose technologies be drawn up and placed under export controls. Representatives of the five major powers have met to seek new methods of restricting the flow of conventional arms into the Middle East and they approved the idea of an international registry of weapons sales. Controls have been tightened on exports

of chemical and biological products which could be used to manufacture weapons. In short, there is greater concern throughout the international community about controlling the supply of arms.

The question that now arises is whether these efforts will be successful and how transfers of weapons and dual-purpose technologies can be further restricted.

However, further consideration must also be given to the drawbacks of this approach to arms proliferation. Are export controls likely to restrict the flow of technologies for peaceful purposes to less developed countries? Do they reinforce the inequality between the great powers that have nuclear arsenals and modern weapons, and Third World countries that are forbidden to acquire modern methods of providing for their security? Have certain arms importers received special treatment because of their peculiar relationship with the great powers? In the medium or long term, does the spread of technological know-how cast doubt on the effectiveness of export controls? Furthermore, do such controls impede the development of other methods of limiting arms proliferation such as security guarantees, nuclear-free zones, openness, confidence-building measures, disarmament agreements with mutual undertakings, and the encouragement of economic and political development? All these questions need further study.

In view of these hopes and questions, the Canadian Institute for International Peace and Security decided to hold an international conference on the effects attempts to restrict the supply of weapons have on non-proliferation. This topic was not chosen in order to indicate a preference for controlling supply over demand, but because it semed the most appropriate one on which to foucs our efforts. Although arms proliferation constitutes one of the Institute's main fields of research, it does not have any official policy preferring one approach to another.

After much consultation, the Institute staff decided to invite nineteen speakers and four eminent personalities to come to Ottawa on 19, 20 and 21 June 1991 to discuss non-proliferation. These internationally renowned experts responded enthusiastically to our

invitation and performed their tasks in a professional and realistic manner. Ten session chairpersons and ten commentators selected from the Canadian public service and Canadian universities completed the ranks of the panelists, providing home-grown expertise in the area of arms control. Finally, those attending the conference included politicians, civil servants, foreign diplomats, journalists, professors, students, researchers, and representatives of various interest groups who all enlivened the discussions with their well-informed questions and observations.

The following report, written by the main organizer of the conference, presents a synthesis of the discussions. The author wrote this summary on the basis of his handwritten notes, official recordings, and printed texts submitted by the speakers. At times he had to summarize arguments in rather cursory fashion or even omit the discussion. The choices that had to be made were not always easy, and the author assumes full responsibility for them, as he does for any errors or omissions which may have slipped into this report. Readers may wish to note that the articles presented by the speakers will eventually be published in book form.

I CURRENT TRENDS

The first two workshops were devoted to general topics. The first was the effects of the war with Iraq on controls on the sale of arms and strategic products. Then second was a far less familiar topic, namely the impact which new producers of arms and dual-purpose technologies have had on world markets, and their position regarding export controls on arms.

The Proliferation of Arms in the 1990s: The Lessons of the Iraq Crisis

The first speaker, **Lewis Dunn** of Science Applications International Corporation, thought that the war in the Gulf would have positive consequences because it drew attention to the proliferation of weapons. He believed that regional races to acquire nuclear weapons would diminish. In the Middle East, Iraq no longer posed a threat to Israel, which also knew now that it could count on American protection against missile attack. The war also demonstrated the military uselessness of chemical weapons and put an end to the myth of the poor peoples' bomb. This recently induced the United States to modify its policy on chemical weapons. However, Mr. Dunn admitted that there remained a serious problem with the proliferation of missiles and conventional weapons. Demand was likely to be high in the future for missiles more sophisticated than the Iraqi SCUDs and above all, for anti-missile missiles like the Patriot. The same would hold true for sophisticated conventional weapon systems, especially for command, control, communication and information systems (C^3I).

Nevertheless, Mr. Dunn believed that the Iraqi example would stimulate efforts to control the supply of technologies needed to produce weapons of mass destruction. The Iraqi crisis established important precedents such as the use of force against aggressors, the United Nations' resolution calling for the elimination of Iraq's weapons of mass destruction, and the initiative taken by the five major powers to control the flow of arms into the Middle East. Chemical weapons have lost their aura, and conventional arms have

regained their place of honour in strategic planning. "Conventional deterrence" appeared to provide a valid new solution to the race for arms of mass destruction.

Mr. Dunn suggested a general strategy for preventing the proliferation of weapons and for at least slowing down those aspects that were impossible to stop. First, the weapon stockpiles of the industrialized countries should be reduced in order to mitigate the enormous disparity between the military power of the North and the South -- a disparity which some Third World regimes invoke in order to justify their acquisition of weapons of mass destruction. Mr. Dunn expressed his satisfaction in this regard with the American decision to renounce chemical weapons and he hoped to see reductions in the nuclear and conventional areas. There should be a multilateral approach to these questions, he said.

Mr. Dunn also wished to see the nuclear Non-Proliferation Treaty (NPT) strengthened. If large numbers of nations signed it, the treaty could help to legitimize controls on the supply of such weapons. He favoured strengthened controls on dual-purpose products[1] in the nuclear field. In addition, special agreements should be worked out for regions that were especially susceptible to nuclear proliferation such as the Middle East, South Asia and Northeast Asia.

According to Mr. Dunn, much remained to be done in the battle to stop the proliferation of missiles. The number of participants in the Missile Technology Control Regime (MTCR) should be increased and the restrictions in the system should be extended to cover shorter-range missiles with smaller throw weights.

As far as conventional arms were concerned, Mr. Dunn thought that progress could only be made by adopting a gradual approach based on recognition of the problem posed by the proliferation of conventional arms and on the conviction that arms exports should

---

[1] These are products which have both peaceful and military applications. An American proposal in this regard is currently under discussion.

not be determined solely by commercial considerations. Mr. Dunn concluded his presentation by saying that the United Nations Security Council would have a role to play the future by putting an end to arms proliferation.

Sergei Rogov of the Institute of USA and Canadian Studies (Academy of Sciences of the USSR) spoke about limiting the supply of weapons in the framework of the transition from the Cold War to a multipolar world. There is much uncertainty at the present time and the possibility of conflict is high. The structures of the arms race still exist (for example, the arms industry). Conventional disarmament in Europe could well throw thousands of weapons onto Third World markets, and declining demand for arms in the North could push manufacturers to seek export markets in the South.

Faced with these dangers, the superpowers, regional powers, and the United Nations should create new security systems in which controls on supply would be one element. Regional security systems could be created through the cooperation of an "inner circle" of countries (in the Third World) and an "outer circle" of countries (in the industrialized world). These systems would help to prevent crises from escalating, build confidence between nations, stop the arms race, and establish genuine mechanisms for conflict resolution. More precisely, there is a need to: 1) avoid proliferation; 2) build confidence and encourage openness; 3) strengthen security agreements; 4) limit arms races; 5) prevent crises from escalating; 6) create favourable conditions for resolving conflicts.

The role of the outer circle countries would be to: 1) guarantee security; 2) oversee the military situation; 3) limit arms shipments; 4) offer mediation; 5) provide technical assistance; 6) establish supervisory agreements. The outer circle should therefore focus first on continuing the discussions between the US and the USSR on disarmament, holding meetings at the United Nations on these matters, negotiating CFE I, improving monitoring techniques, and bolstering mechanisms to reduce supply such as COCOM and LNC. With regard to the last point Mr. Rogov wondered whether COCOM could be used to reduce shipments to the South. It could be re-directed and different, and broader mechanisms could be created. However, these mechanisms are imposed on the Third

World and do not represent genuine political solutions. Mr. Rogov suggested that the emphasis should be on regional agreements prohibiting weapons of mass destruction and certain types of conventional arms.

The session commentator, **Mark Heller**, research coordinator at CIIPS, observed that the conference was devoted to reducing the *supply* of arms because the international situation lent itself more at the present time to agreements among suppliers than among purchasers. The former realized, after the war with Iraq, that the arms they send around the world could well land them in difficulty at some time. According to Mr. Heller, we should take advantage of this passing international situation in order to study ways of arriving at permanent agreements on limiting arms transfers. He emphasized that it would be necessary to include confidence-building measures between producers so that they could be assured that the arms control agreements would not give their competitors an unfair advantage.

Discussion: One participant said that Mr. Dunn's assessment of the ability of the international community to work together was overly optimistic. The members of the coalition against Iraq had not even been able to agree on the basic principles underlying their action. Third World leaders would simply conclude from the Iraq episode that a nineteenth-century style war could not succeed against a great power and that it was better to employ guerilla tactics or nuclear weapons. The fact that whites possessed nuclear weapons would not dissuade Third World nations from going to war, though the opposite could well be enough to intimidate the wealthy nations. This participant remarked further to Mr. Rogov that controls on strategic exports represented an attempt on the part of Europeans to preserve their monopoly on sophisticated arms. He wondered whether it was realistic to think that the control which the European countries exercised over the Security Council would still exist in the year 2050 when only ten percent of the world's population would be white.

Messrs. Dunn and Rogov responded to these remarks. According to Mr. Dunn, international resistance to aggression would not materialize in all circumstances; however,

he believed that a coalition against Iraq could have been formed even if Saddam had had nuclear weapons because of the degree of anger and sense of urgency felt in the West. Mr. Rogov reiterated his conviction that the UN would prove more important in a multipolar world. Arms control was vital for the security of the Third World, though it was also necessary in case US-Soviet rivalry re-emerged and because it encouraged the conversion of arms industries. Weapons reductions were necessary for the East, the West and the South. **Bernard Wood**, of CIIPS, added that the UN could be asked one day to develop legislation on arms transfers, a procedure which would have more legitimacy in the eyes of some countries than measures taken by Western cartels.

Another participant suggested that the demand for sophisticated technologies might increase in the wake of the war with Iraq. He also raised the question of the role played by new producers in supplying Third World countries with weapons. Mr. Dunn said that we should consider developing a new system or at least particular arrangements to control transfers of dual-purpose technologies. In response to the second comment, he noted that there was less concern now about the effects of new arms producers than there had been a few years ago because these countries had not yet mastered a number of advanced technologies needed to make up-to-date weapon systems. The exception to this general rule was China which was an important producer of missiles. However, Mr. Dunn thought that the problem could be resolved by means of diplomatic pressure and international accords.

New Arms Producers and Dual-Purpose Technologies: Are They the Primary Obstacles to Attempts at Restricting Supply?

Renato Dagnino of the University of Campinas set out to demonstrate that Brazil posed no greater threat to the traditional arms suppliers than other new producers. He pointed out that while 61 percent of the export markets for arms were in the Third World, Northern countries supplied 94 percent of this demand. Among the 100 largest arms-producing companies in the world, forty-eight were American. Large companies in

the Third World accounted for only 1.7 percent of world sales. In addition, Third World military products were not very sophisticated.

Brazil's military industry flourished during the war between Iran and Iraq. At this time, the arms trade between Brazil and Iraq was the biggest example of military cooperation between two developing countries, and yet Brazilian exports accounted for only 1.9 percent of all Iraqi arms. Since the end of this conflict, Brazilian arms exports had levelled off. According to SIPRI, Brazil was the world's eleventh largest exporter of arms, although its military leaders had a tendency to embroider national production statistics. Now that Embraer Corporation no longer produced military aircraft, Brazil might well slide further down the list.

In so far as Brazil's dual-purpose technologies were concerned, Mr. Dagnino said that they were largely directed toward military purposes and that civilian applications were rare. Production had been stimulated by the interest of military leaders, but Brazil's progress in high-tech sectors had been slowed by export controls instituted by the North on certain secret technologies. Mr. Dagnino admitted that the presence of the Brazilian military in the country's large research laboratories was impeding Brazil's economic development and damaging its security.

In short, Mr. Dagnino did not believe that Third World producers posed a threat on arms markets or that they had much of an effect on the control policies adopted by the industrialized countries.

William C. Potter of the Monterey Institute of International Studies examined new producers in the nuclear area. He pointed out first that only China was a major new producer, although Argentina and Spain were making progress, as was Japan.

He said that the drive to export arose in these countries when internal markets crumbled. However, the economic benefits of nuclear exports were usually quite meagre. There were usually very few transfers between new producers, to some extent because

such transfers were banned by international non-proliferation agreements but mostly because the countries involved realized that it was in their interest to be cautious with nuclear exports. In all, new producers seemed to be behaving in an acceptable manner and their sales were generally subject to the guarantees of the International Atomic Energy Association (IAEA). However, Mr. Potter did point to some areas of concern, including the refusal of some countries to adopt the non-proliferation agreements and the development of ballistic missiles.

Standards governing nuclear trade were in fact in a state of transition. Some new producers (especially Argentina and Brazil) might well feel inclined to subscribe tacitly to the export rules of the London Nuclear Club (LNC), except that their export control systems were not fully developed.

Mr. Potter then turned to some deficiencies in the Soviet Union's export policy. He said that they sold or offered to sell nuclear products that were not subject to international guarantees, to countries which refused to provide full guarantees and to subscribe to the NPT, and which had nuclear programmes for military purposes. In February 1990, the USSR offered to sell a reactor to Pakistan without full guarantees. In addition, two nuclear reactors were offered to India. Last year, the USSR offered heavy water to Argentina without demanding guarantees, and it has held discussions with the Argentinians about signing a research agreement on breeder reactors. Moscow was said to have considered selling a reactor to Israel last April. The Soviets also sold Cuba a 10 MW IRT research reactor that used highly enriched uranium. As a result of Soviet behaviour, some new producers might conclude that there was no advantage to signing NPT and applying complex safeguards.

The session commentator, **Harold Klepak**, of the Collège Militaire Royale in St-Jean, said that he found Professor Dagnino's talk very informative. He added that studies should be undertaken of the role played by military people in decisions to develop certain military technologies and of their underlying motives, especially the desire for prestige. The abandonment of nuclear programmes for military purposes in Argentina and

Brazil demonstrated the importance of democratic rule for non-proliferation. However, it was impossible to draw any definitive conclusions about Brazil and other new producers because the future could be full of surprises. Mr. Klepak commented further to that it was not very clear why countries began exporting nuclear products and that no model for this behaviour could be uniformly applied to the Third World. Cuba's nuclear programme was unlikely to prove dangerous, because of the country's lack of resources. He concluded by reiterating Mr. Heller's remark that studies should be undertaken of methods for building confidence between nuclear producers.

Discussion: One member of the audience observed that Mr. Dagnino failed to mention arms industries that were developed in Third World countries in order to satisfy large internal markets, as in India. Mr. Dagnino replied that neither India nor any other Southern country produced arms which were of interest on international markets and that the arms industries in these countries were withering because they were too expensive. Members of the audience raised objections to these comments, pointing to the broad array of weapons produced in India, the likelihood that arms industries would emerge in the South in the future, and the destabilizing effect that sales of these arms might have on some conflicts.

It was claimed that Mr. Potter perhaps went too far in his criticism of Soviet exports. Mr. Potter replied that, disregarding the relative importance of particular cases, there was cause for concern about the possible relaxation of Soviet policy regarding nuclear exports. Another member of the audience supported Mr. Potter, pointing to Mr. Gorbachev's offer to sell plutonium and MOX uranium to Japan and claiming that the main danger posed by Soviet exports was that they were not subject to full guarantees.

II CONVENTIONAL WEAPONS

Trends in Production and Trade

Michael T. Klare of Hampshire College claimed that weapons' exports would soon increase, according to an analysis of the political, military, technological, and economic factors that influenced the arms trade. First he offered a historical overview. The United States' strategy from 1973 to 1984 was to support its allies in the Third World through massive arms sales. The Soviets pursued the same strategy, and the technological gap between North and South widened. The end of the war in Vietnam resulted in excess production capacity which was redirected toward the South. The Middle East became the main export market: while it had only absorbed 27 percent of all exports in 1974, by 1983 it was absorbing 43 percent. For the rest of the 1980s, arms traffic declined of several factors, including the end of the Cold War, *perestroika*, the decline of the USSR, the moderation of conflict in the South, problems of absorption in the South, low excess capacity in the American arms industry under Reagan, the economic difficulties of the Third World, the declining price of oil, and the exponential increase in the price of arms. Recently, markets in Southeast Asia had revived. Imports of high-tech products had begun to increase, as well as of packages to modernize existing weapons systems.

Despite the Soviet retreat from the international stage, the Americans have continued to expand their influence and are intervening even more in the Third World. President Bush said in 1989 that this was where future threats to the United States would originate. He refused to institute an embargo on weapons destined for the Middle East because it would have applied to the United States' traditional allies in the region as well. This position has not changed, despite Mr. Bush's speech on the Middle East delivered 29 May 1991. Other large producers such as France, the United Kingdom and China will have to maintain their sales in order to keep up their rate of production. Despite the declining number of conflicts between countries, states in the Middle East and Asia still want to acquire modern weapons and sophisticated military technologies. For these reasons, Mr. Klare concluded that the arms trade would increase in the very near future.

Keith Krause of York University presented a different analysis of the situation. Military budgets have increased by only 0.6 percent a year since 1984. On the geopolitical level, most arms purchases were prompted by the Cold War and decolonization, two factors which have now disappeared. There is of course a trend toward the acquisition of weapons of mass destruction -- motivated in part by the very restrictions on these weapons -- but such arms are not very useful from a military point of view. There are, therefore, surpluses at the present time and a large capacity for the production of conventional arms. In the long term, however, production capacity will likely decline by 25 to 33 percent compared to today. Mr. Krause acknowledged that, in a tight market, competition between suppliers and subsidized sales could stimulate demand. Nevertheless, he believed that stagnating arms markets would also have the effect of encouraging modest efforts to reduce exports.

Mr. Krause concluded by saying that efforts to limit conventional arms should focus on basic problems. Economic assistance should be linked to military sales, regional security agreements should be drawn up, and arms sales should be replaced by sales of modern technologies for civilian purposes.

Jim Fergusson of the University of Manitoba noted that the conference had hitherto been largely devoted to the effect of demand on the arms market, and little had been said about the effect of supply. Supply, he said, fluctuated according to the interests of various countries and companies and according to changes in production conditions (in particular the globalization of the arms industry). The type of supply would affect the chances of success of various systems for controlling it. For example, how would the conflict be resolved between the American government, which wanted to prevent the spread of strategic technologies, and industries which wanted to sell their products? Would the reduction of export markets in the North increase pressure to export to the South? Would the diversification and conversion of arms industries help to mitigate the pressure to export?

Discussion: One member of the audience wondered whether the purpose of export controls was to maintain American dominance in the arms market and asked how that affected controls on supply. Both speakers believed that the spread of technology could not be stopped, though for different reasons. Mr. Krause thought that although the Americans still dominated the arms industry, they would eventually have to export more goods, just like the Europeans, in order to cover the enormous costs of research and development. According to Mr. Klare, Japan was already virtually the equal of the United States in military innovation, and other Asian countries were hot on the heels of the Europeans. Mr. Krause objected, however, that this conclusion was based on the doubtful premise that military technology was a spin-off of civilian technology. Another audience member said that if Japan were an important supplier of components (especially electronics) for American weapons systems, it should be considered a large exporter and invited to the discussions on controlling arms exports. The speakers were invited to comment on recent initiatives undertaken to control conventional arms. Mr. Klare stated that proposals like those of Mr. Mulroney might have an interesting effect if they were applied. He added that it would be a good beginning if Western countries practised what they preached in regard to export controls. Mr. Krause said that agreements between producers would slow the spread of weapons, thus helping to prevent the destabilization of certain regions and giving diplomats more time to resolve conflicts. The speakers did not agree on the role which the Soviet Union would likely play on arms markets. Mr. Klare thought that it would probably keep its share because of the inherent incentives of the free market, while Mr. Krause thought that it would lose out because of its lack of competitiveness, which would become evident when Soviet cost prices were compared internationally.

Strengthening Export Controls

Katarzina Zukrowska of the Polish Institute for International Relations spoke about her country's arms exports. She said that the policies of the countries of Eastern Europe in this regard were now under review. Czechoslovakia and Hungary had already announced that they would stop exporting arms. Poland would continue, though only 25 to 35 percent of its

arms production capacity was utilized and this proportion would diminish due to the technological obsolescence of this sector. Polish production traditionally served the needs of the Warsaw Pact, but now that it had dissolved, the industry would have to throw itself on the free market where its success was far from guaranteed.

The end of communism highlighted the need for policies, legislation and controls in the area of arms exports, and Poland had begun this process. In 1989, it revealed the details of its weapons exports for the first time and then developed new guidelines. The Polish government now keeps a secret "black list" of countries to which arms exports are temporarily suspended. It also now requires the border inspection of exports and insists on a clause governing the final use and requiring the purchaser not to re-export Polish deliveries.

The future of the production and the purchasing of arms in Poland is uncertain. Some would like to see its ties in this sector to the USSR continued and some export activities maintained. Others would like to eliminate the production of arms in Poland and to purchase arms in the West, especially in Germany. Still others think that Poland should preserve its national industry so that it will not find itself some day bereft of a defensive capability as in 1939. Defence cooperation agreements could be signed with other countries in Central Europe. The outcome of this debate will have a strong influence on Poland's place in world arms markets.

Stephanie Neuman of Columbia University spoke about controlling the supply of arms from an American perspective. Ms. Neuman, an acknowledged expert on the arms trade, said that she was not equally well informed about controlling arms but that she wanted to rise to the challenge set by the conference organizers when they asked her to discuss this aspect. She summarized her written text, putting the emphasis on the last two of its five sections.

First she noted that the war with Iraq had created a tendency in public opinion to favour tighter controls on arms exports. There were of course numerous impediments to this, including geopolitical and economic interests. It was important to point out, however,

that one major obstacle to arms controls was often forgotten; namely, there was no agreement on the general primary objective of controls on conventional arms. Was it to safeguard the security of the industrialized world or of the Third World?

Ms. Neuman outlined the main factors favouring arms controls. The end of the Cold War, she said, made it possible to limit arms shipments to certain regions of the Third World. The decline of the USSR rendered it technologically dependent on the United States and heavily in need of a stable international environment. The United States was now the only superpower and its domination of the arms market was total. Its lead in R&D was so great that any country that wished to modernize its equipment needed American technology. The American market for military products was the largest in the world and was vitally important to many secondary exporters, including Canada. However, imports took only a small fraction (5 to 15 percent) of the American market. In conclusion, the United States' domination of the arms market enabled it to exercise enormous influence over arms controls. Structural changes in the market (an 18 percent decline in world arms imports between 1984 and 1988) were making life difficult for competitors of the United States. The Europeans, including the French, were discovering that they could not produce all their arms and would soon have to import more from the United States.

In the last part of her talk, Ms. Neuman proposed some methods for reducing weapons sales. First, an answer has to be provided to the question: why should conventional arms sales be controlled? Is it in order to promote regional balances or to enhance the security of the United States? Second, the public must be better informed in order to reduce its expectations regarding general, complete disarmament. The latter is impossible, according to Ms. Neuman, and it would be better for people to cultivate more modest and achievable goals. Third, emphasis should be placed on qualitative limits on weapons exports rather than on general limits. Fourth, producers need to reach some agreement on the definition of a critical technology or weapons system. The American government has established working groups on this question. On the international level, the United Nations could play an active role in this undertaking. Arms purchasers should

also participate in these discussions to ensure their cooperation and help prevent cheating. Fifth, stronger internal administrative controls should established (especially in the United States) in order to avoid contradictory actions on the part of various government agencies involved in strategic exports. Sixth, methods of monitoring the controls on conventional arms exports need to be considered. Seventh, a compensation and penalty system should be established. Japan's recent initiative linking foreign aid to the extent of military activity is a step in the right direction. Eighth, a regional approach should be preferred to a more global approach in the area of export controls. Finally, an effort should be made to promote openness in the arms trade.

Ernie Regehr of Project Ploughshares commented first on Ms. Neuman's address, stating he was surprised to find himself in agreement with almost everything she said, except with the idea of reducing public expectations in regard to disarmament. He believed that the recent Canadian initiatives were, to the contrary, aimed at bolstering public expectations about disarmament and at enhancing security at reduced levels of armaments. An arms control "culture" needed to be fostered and maintained. Mr. Regehr drew a parallel between Poland and Canada, two secondary exporters which found their traditional markets drying up. The governments of these countries include in their arms purchasing agreements economic benefit clauses which require the supplier to carry out part of production in the purchasing country. This creates additional impediments to export restrictions. Countries should develop bilateral formulas for regulating transfers, creating more openness, and even controlling the acquisition of arms.

Discussion: Ms. Neuman's presentation prompted a number of questions. She was asked if the victory over Iraq would not stimulate the demand for ultra-modern weapons and endanger efforts to reduce transfers. She replied that these weapons were too expensive for the vast majority of countries, except those in western Europe. Second, the United States was reluctant to export its most sophisticated technologies, except again to Western Europe. Audience members said they thought the equation which Ms. Neuman drew between arms and security was too facile; genuine security did not flow, they said, from ensured American military superiority but rather from solving economic and social

problems. Ms. Neuman admitted that the United States had many problems to which more money needed to be devoted, but maintained that in the real world the United States could not do without a strong defence.

III NUCLEAR WEAPONS

Trends in the Proliferation of Nuclear Weapons

John Simpson of the University of Southampton (United Kingdom) addressed the question of why there are not about twenty nuclear powers by now, as was forecast at the time of President Kennedy. The proliferation rate has been substantially below predictions of a generation ago, even though nuclear technology is now fifty years old and can no longer be kept secret, stocks of highly fissionable materials are rapidly increasing, and some countries have acquired nuclear weapons. Mr. Simpson pointed to five factors that have contributed to the slow rate of proliferation: 1) the security guarantees provided by the United States have reduced the need to have one's own nuclear weapons, especially in Europe; 2) military leaders hesitate to embrace nuclear arms because they reduce the resources available for conventional weapons; 3) nuclear energy in general, and the pressure groups that promote it, has lost favour; 4) nuclear weapons are no longer considered essential; 5) the system to prevent proliferation and the NPT have created obstacles to acquiring nuclear weapons.

Nevertheless, proliferation remains a problem. Some "latent proliferators" possess sufficient fissionable materials to create a minimum nuclear arsenal (at least twenty-five bombs). Fortunately only India, Israel and Pakistan remain in this category after the withdrawal of Argentina, Brazil and South Africa. A second category is "slow proliferators" which have been more vulnerable to international sanctions, such as North Korea. "Unpredictable proliferators," such as Libya, want the bomb but do not have the means to produce one. They hope to purchase or steal what they need. Finally, there are a number of countries that have all the necessary resources for building nuclear weapons but choose not to do so.

Mr. Simpson discussed the effects of export controls on these various categories of countries. Such controls impede the "latent proliferators," which are more vulnerable to

export controls. Their nuclear plants are usually subject to international guarantees and it is easy to determine if they are attempting to build atomic weapons.

With regard to the "unpredictable proliferators", the whole range of non-proliferation techniques can be applied. In particular, everything possible should be done to control transfers of highly fissionable materials, especially now that arms reductions on the part of the superpowers are going to increase the amount of enriched uranium and plutonium available on the market. In so far as the highly industrialized states are concerned, nothing much can be done if they decide some day to acquire the bomb.

The main trends in non-proliferation at the present time are as follows.

- The Iraq crisis stimulated efforts to control exports. The London Nuclear Club (LNC) has experienced a revival. More and more countries support full guarantees. There are increasing efforts to promote non-proliferation in the framework of COCOM and the Missile Technology Control Regime (MTCR). Germany and Japan are inclined to use their influence to promote nuclear non-proliferation.

- The number of countries that have signed NPT is increasing, and countries that are unwilling to sign this treaty can create their own non-proliferation agreements, as Brazil and Argentina have done.

- There is a political will to reinforce the system of international guarantees.

- The United States is no longer the focal point of the non-proliferation system, which has broadened to include Europe and Japan as well.

However, Simpson also pointed out certain potential dangers in the non-proliferation system. In particular, the end of the Cold War and the dissolution of

alliances may weaken the security guarantees provided by the superpowers. This could prompt renewed interest in nuclear weapons. In addition, the Non-Proliferation Treaty may have been undermined by the American bombing in Iraq of civilian nuclear plants subject to international guarantees.

Leonard Spector of the Carnegie Foundation provided his views on non-proliferation and then took stock of the Iraq situation in particular, noting the following trends:

- The countries that are now actively attempting to acquire nuclear weapons (Iraq, Iran, Libya, North Korea) all oppose the international *status quo* and are hostile to the West. During the 1970s, the quasi-nuclear countries were all fairly friendly toward the West. Even India, though far from being an ally of the United States, was still not hostile.

- Proliferators during the 1970s sought to acquire their reprocessing or enriching equipment in France or Germany, while contemporary proliferators rely more on the black market. This is a result of American non-proliferation policies and the effectiveness of export controls. Western countries, especially the members of the London Nuclear Club, have recently been emphasizing export controls on dual-purpose products, attempting thereby to make the acquisition of dangerous technologies more difficult for proliferators.

- Countries which have acquired a nuclear capacity are not resting on their laurels and are attempting to strengthen that capacity. In particular, India, Israel and Pakistan have built plants for the production of tritium, which will enable them to produce thermonuclear devices.

- It is possible to contain proliferators through confidence-building measures. Pakistan and India have made progress in this direction.

- The Iraq situation has underlined the deficiencies in NPT, which cannot prevent the accumulation of fissionable materials because they are needed for civilian production as well. Iraq could have diverted some of its enriched uranium between two international inspections and quickly manufactured nuclear bombs (it should be remembered that nuclear weapons *research* is not forbidden by NPT). There is therefore increasing discussion at IAEA of instituting special inspection procedures and of increasing the frequency of inspections in certain critical cases.

- Attacks on nuclear plants for civilian purposes have become common. Iran, Israel, Iraq and the United States have carried out such attacks since 1980. In South Korea, some people believe that a surprise raid should be carried out to destroy North Korea's nuclear potential.

- Thanks to the efforts of Brazil, Argentina and South Africa, we know now that it is possible to reverse the nuclear proliferation process when national and international conditions are right. This confirms the belief that restrictions on supply help gain time while waiting for political conditions to improve.

Spector discussed the extent of Iraq's secret nuclear programme, as was known in June 1991. Iraq was previously known to possess a small amount of enriched uranium subject to IAEA guarantees and its long-term plans to enrich uranium by using centrifuges was also known. However, it was then learned that Iraq was employing an old enrichment technology using electro-magnetic procedures. It is possible that Iraq succeeded in producing 40 kg of enriched uranium, enough to produce two good-sized atomic bombs. When all is said and done, it is clear that Iraq seriously violated NPT and doubt has been cast on the international inspection system. Distrust of other nations may well increase because confidence in the international system has been seriously undermined.

Albert Legault of Laval University commented on the addresses of both these speakers. He did not have as much confidence as they in export controls. The West may

fear technology transfers, but it cannot prevent the spread of nuclear technology. The best method of preventing the proliferation of nuclear weapons is to tie technology transfers to promises of non-proliferation. That is what NPT has done. This method of providing conditional access to nuclear technology has a proven track record and could help to limit the proliferation of missiles. Third World countries could be persuaded not to acquire ballistic missiles by offering them instead the advantages of belonging to an international space agency.

Discussion: Mr. Simpson was asked what conduct would be appropriate toward latent proliferators if export controls were ineffective with them. In particular, should they be offered technologies and know-how that would enable them to gain better control over their nuclear weapons? Mr. Simpson did not think that such a policy would be appropriate because recognition of the nuclear status of proliferators amounted to an admission that the non-proliferation policy had failed. Mr. Spector was asked whether he thought that American permissiveness toward certain proliferators was likely to diminish. He replied that he thought so, at least in regard to Pakistan. The relative tolerance shown by the United States toward Pakistan was due to the war in Afghanistan. Mr. Simpson did not wish to advance an opinion regarding other proliferators. The question of a comprehensive nuclear test ban treaty (CTBT) also arose. According to Mr. Simpson, the importance of such a treaty depended on the way in which one interpreted the NPT. If the Treaty was interpreted as a disarmament agreement, then the CTBT was crucial; if however the NPT was interpreted as an arms control agreement, the CTBT was only of secondary importance. Mr Simpson thought that the CTBT would now be more important for its symbolism than for its real effects. In fact, section VI of the NPT did not even mention CTBT.[2] The latter could not prevent the spread of non-nuclear technologies, such as missile-related technologies, which were now at the heart of atomic arsenals. Messrs. Simpson and Spector said they did not think that adherence to article VI of NPT would cause division among those attending the conference to renew the Treaty in 1995. They both thought that the vast majority of countries were happy with

---

[2] Article VI asks the parties to progress toward general and complete disarmament.

the way the Treaty was observed and needed it to feel secure. In addition, much of the criticism would be lessened by the huge strides which the Americans and Soviets were making toward disarmament. Finally, they thought that even without the CTBT the frequency and strength of nuclear tests would diminish considerably in the next few years.

Controlling Nuclear Exports

Pierre Lellouche, advisor to the mayor of Paris, France on international issues, outlined the world situation after the Cold War and the Iraq crisis. He said that much satisfaction was taken from the end of the ideological confrontation and the nuclear discipline maintained by the great powers, but that the Gulf crisis had highlighted a number of dangerous impulses emanating from the South: population growth, increasing inequalities, marginalization, nationalism, fundamentalism and militarization. This was the context in which nuclear proliferation must be seen.

According to Mr. Lellouche, export controls were one aspect of non-proliferation, but they were not the most important. The control system developed in the 1970s produced positive results, but it rested on a fundamental contradiction. It helped to prevent the diversion of certain civilian technologies to military purposes but failed to stop the creation of secret military programmes. The export control system was established at a time when some industrialized countries, including France, were undertaking ambitious programmes for the construction of nuclear generating stations and when some countries in the South were also turning to nuclear energy. A lucrative export market therefore emerged and fierce competition developed between suppliers. However, after the explosion of a nuclear device in India and the announcement of contracts with terms that were dubious from the point of view of non-proliferation (for example between France and Pakistan), the American government succeeded in imposing the formation of a suppliers' cartel (LNC). It adopted a policy of requiring full guarantees as a condition of sale. According to Mr. Lellouche, these unilateral measures on the part of the American

government ran counter to the commitments made in article IV of the NPT to encourage peaceful cooperation.

Fifteen years later however, the system enjoys widespread support. Twenty-six countries subscribe to the LNC guidelines, though China does not. The control measures have certainly complicated matters for potential proliferators, whose numbers in 1991 are no greater than in the 1970s. If the Brazilians, Argentinians and South Africans place their nuclear industries under international monitoring, there will be only a few nuclear plants in the Third World that escape IAEA controls: a research reactor, a power reactor and a reprocessing plant in India; an enrichment plant in Pakistan; a reactor and a reprocessing plant in Israel; and probably plants which are under construction in Iraq, Iran and North Korea.

Nevertheless, the export control system has its limits, and it is doubtful that it will endure as the main instrument of non-proliferation. First, the market for nuclear power has been stagnating for many years. Nuclear-generated electricity in the industrialized world is now at 250,000 MW, or only one quarter as much as what was predicted twenty years ago. The "plutonium economy" has failed to materialize. Finally, proliferators are escaping the controls of international systems through clandestine methods .

It is therefore necessary to go beyond the established control procedures and consider proliferation not in theory, but in its geopolitical context. According to Mr. Lellouche, fourteen countries are possibly conducting clandestine nuclear programmes: South Africa, Argentina and Brazil,[3] North Korea (the key to the East Asia region), South Korea, Taiwan, Syria, Egypt, Libya, Iraq, Iran, Pakistan, Israel and India.

Mr. Lellouche said that advantage should be taken of the psychological shock created by the war in the Gulf in order to strengthen non-proliferation measures. First,

---

[3] These three countries have officially abandoned their military programmes and have said that they are ready to submit their nuclear plants to international inspection. In addition, South Africa has announced that it would sign NPT.

Security Council Resolution 687 on the destruction of Iraq's nuclear potential, which sets a precedent in the area of non-proliferation, should be applied in full. Second, the Security Council, in consultation with IAEA, should keep records of all high-tech exports to the above-mentioned countries. These should be maintained until these countries agree to subject their nuclear programmes to full guarantees or sign the NPT. Third, border controls should be strengthened and funding should be increased for intelligence services interested in nuclear proliferation. The Security Council should be entitled to send a team of inspectors into any country suspected of conducting nuclear activities. If the activities are not stopped, international sanctions should be applied. Fourth, China should be induced, through economic pressure if necessary, to observe the LNC guidelines on nuclear transactions.

At the same time, however, exporters of nuclear materials should be careful not to push restrictions on technology transfers too far for fear of compromising all North-South cooperation.

Paul Leventhal, the president of the Nuclear Control Institute, asked whether it was worthwhile trying to fill the gaps in the nuclear export control system. It was in fact very difficult, he said, to persuade exporters to agree to any extension of export control measures. In addition, since the restrictions also covered large numbers of dual-purpose products, there was a danger of alienating poor countries which wanted technology transfers. Finally, the efforts undertaken to limit exports did not stop clandestine nuclear weapons programmes.

Almost all large suppliers had concluded shady transactions from the point of view of non-proliferation. West Germany had authorized numerous sales of dangerous products, despite diplomatic efforts undertaken by the United States and Great Britain in this regard. France, the USSR and China had concluded many transactions not subject to safeguard procedures with potential proliferators. Even the United States was guilty. In particular, it sold certain products to India until 1976 and, for political reasons, turned a blind eye to the nuclear activities of China and Pakistan.

Mr. Leventhal then turned to the lessons to be drawn from the Iraq crisis. First, he said, the NPT had facilitated the transfer of dangerous products to Iraq and had failed to prevent Saddam Hussein from conducting his nuclear programme. Then, IAEA guarantees failed to reveal in time the diversion of highly fissionable materials by Iraq and to detect its secret nuclear activities. Finally, the Iraq case demonstrated the difficulty of rolling back a country's nuclear capability. It was evident that Iraq had concealed materials and technologies for building the bomb and that it played a cat-and-mouse game with international inspectors. An Iraqi defector eventually revealed the existence of an enriched uranium programme based on old calutron technology, a programme the Western countries knew nothing about.

Mr. Leventhal drew the following conclusions from his analysis of the international non-proliferation system and the Iraq crisis:

- Measures for controlling exports need to be strengthened, though without damaging other aspects of non-proliferation. We should not attempt to control dual-purpose technologies, but should concentrate instead on nuclear materials that are not subject to international controls such as tritium, heavy water, natural uranium and calutrons.

- Good intelligence about nuclear activities and the ability to react quickly are more effective non-proliferation tools than export controls. Methods should be developed to enable the Security Council to take action against exporters and importers who engage in activities which further nuclear proliferation and to avoid in this way other confrontations like the Iraq crisis.

- Close attention should be paid to repairing the deficiencies in the IAEA and NPT systems. In particular, the frequency of IAEA inspections should be increased because, under the present circumstances, countries have sufficient

time between inspections to use highly fissionable materials to produce nuclear bombs.

- The most important but least acknowledged aspect of the proliferation problem concerns the accumulation, through civilian nuclear programmes, of materials which could be used to produce nuclear arms. It is questionable, for example, whether it will ever be possible to ensure that large quantities of plutonium cannot be diverted. Finally Mr. Leventhal recommended the creation of international storage centres for plutonium and used nuclear materials.

Tariq Rauf, a researcher at the Canadian Centre for Arms Control and Disarmament, said that the nuclear trade system imposed mutual obligations. Purchasers were required to submit to inspection and vendors to maintain open supply. However, vendors have been regularly accused of failing to fulfil this condition. In the future, they should uphold the provisions of NPT articles III and IV. Mr. Rauf then said that there was no "technological determinism" forcing countries to acquire nuclear weapons; instead, political and psychological factors were at work. The non-proliferation successes in South America were due to a regional approach to security problems and not to export controls. There was a contradiction between the prohibition on nuclear arms for the Third World and the right of five powers, fully acknowledged by NPT, to possess them. Mr. Rauf denied that the Iraq crisis had had very positive effects. It had not really been a United Nations war, and despite Resolution 687, potential proliferators would conclude from the whole affair that it was best to keep their nuclear programmes secret. He emphasized that the key to non-proliferation was a regional approach.

Discussion: Part of the discussion dealt with a regional approach to non-proliferation and a strategy based on the Security Council. One participant said to Mr. Rauf that, even if it were assumed that the intervention in the Gulf was a singular event, Resolution 687 still constituted an important precedent which might well have a dissuasive effect on potential proliferators in the future. When another participant emphasized the importance of a regional

approach in the Middle East, Mr. Lellouche agreed that it had a role to play. Mr. Leventhal expressed his reservations regarding Mr. Rauf's comments on the effects of a regional approach in South America. If a policy of requiring full guarantees had not been in place, according to Mr. Leventhal, Brazil and Argentina would have found it much easier to acquire the products needed to manufacture bombs. Export controls therefore had the effect of raising the cost of nuclear programmes for military purposes, and it was their analyses of the costs involved that prompted the two South American rivals to abandon their nuclear ambitions. Nevertheless, Mr. Leventhal recognized the benefits of a regional approach, which should be applied in parallel with controls on transfers of fissionable materials and reductions in the nuclear stockpiles of the superpowers.

There was further discussion of the relative merits of the French and American approaches to non-proliferation, as presented by Messrs. Lellouche and Leventhal. One participant said that he understood the French approach to be that Third World states should be induced to support the nuclear export control system through liberalized trade with them, rather than by trying to exclude them by imposing restrictions. However, Brazil's secret military programme had demonstrated the failure of the French approach since even more cooperation with Brazil would have had the effect of expanding its military efforts rather than of bringing the government to its senses. Mr. Lellouche replied that the American approach was too abstract and did not distinguish between well-intentioned states and potential proliferators, punishing the first as well as the second and failing in the end because proliferators created secret programmes which escaped the controls on nuclear commerce.

According to Mr. Lellouche, it was better to increase the capabilities of intelligence services than to impose restrictions on exports of nuclear power plants. Mr. Leventhal responded that the purpose of controls on nuclear technology for civilian purposes was simply to ensure that countries did not use their civilian programmes to support parallel military programmes. He suggested that France should agree to the policy of requiring full guarantees, about which there was consensus among the parties to the NPT, before being accepted as a signatory of it. The same should also hold true for China. Mr. Leventhal

went on to say that France should abandon its breeder reactor programme because it would never be possible to monitor reliably the large quantities of plutonium needed as fuel. Mr. Lellouche replied that Mr. Leventhal's approach was extreme and non-productive to the point that he would even deny France the right to sign the NPT under the pretext that it rejected the policy of requiring full guarantees. Furthermore, according to Mr. Lellouche, France might not be wrong in believing that plutonium would be the nuclear fuel of the future.

IV OTHER WEAPONS OF MASS DESTRUCTION

Chemical Weapons

Julian Perry Robinson of the University of Sussex (Great Britain) was forced to cancel his trip to Ottawa for personal reasons. However, he asked **Gordon Vachon**, a commentator on the panel, to present a summary of his paper.

Despite the vagueness of the term "countries with chemical weapons," it was possible to agree, according to Mr. Robinson, that at least four countries in the Third World were proliferators of this type of weapon: Iraq, Iran, Syria and Libya. Mr. Robinson feared that the use of chemical weapons during the last few years and the spread of chemical technology were leading to a situation in which the prohibitions on such weapons were weakening while the technology was becoming increasingly available.

Mr. Robinson then turned to the military, political and institutional sources of chemical proliferation. He disliked the term "the atomic bomb of the poor," which was sometimes used in reference to chemical arms. It falsely implied that chemical weapons could be used for deterrence. This misconception helped to maintain the "popularity" of chemical weapons and the link which some countries claimed to see with nuclear disarmament. In fact, according to Mr. Robinson, chemical weapons were of little military use. The technology was stagnating, defensive measures were growing more effective, and high-power conventional weapons were more attractive.

Mr. Robinson addressed various methods of preventing the spread of chemical weapons. First, the taboo surrounding gas warfare should be strengthened. When acquisitions of chemical weapons come to light, open diplomacy can have a positive effect. Adoption of the international Chemical Weapons Convention is essential. In so far as controlling exports is concerned, Mr. Robinson believes that total prohibition is impossible because 1) proliferators can always substitute locally acquired equivalents for imported processes, basic materials and equipment; 2) proliferators can take advantage of the

opposition of industry to export controls. Nevertheless, Mr. Robinson believes that measures to restrict supply are useful in the short run because they raise the cost of acquiring chemical weapons, thereby slowing proliferation. However, in the longer run such measures could poison North-South relations.

Mr. Robinson said that he was happy with the inclusion of efforts in the areas of both supply and demand in the future chemical weapons convention (CWC). He thought that this was the main goal of non-proliferation and he warned against the belief that regional arms control agreements could deal adequately with the problem.

Elisa Harris of the Brookings Institution said there were fifteen Third World countries suspected of conducting secret chemical weapons programmes: Iraq, Iran, Syria, Libya, China, North Korea, Taiwan, Israel, Egypt, Ethiopia, Myanmar, South Korea, Vietnam, India and Pakistan. The first seven countries on this list were also suspected of conducting biological weapons programmes.

According to Ms. Harris, efforts to prevent proliferation have traditionally focussed on measures to restrict supply, and they have generally been useful. However, the effectiveness of this approach will decline as the technology spreads. Therefore export controls need to be supplemented by the creation of impediments to the use of chemical weapons.

Controls on chemical exports have been tightened since Iraq resorted to gas warfare against Iran in 1984. Ms. Harris mentioned Germany, whose companies had helped Iraq and which has now tightened its control measures, and Great Britain. The United States has also decided to toughen its policies on the export of chemical and biological products. The Australia Club, which at first set limited objectives, now controls the sale of fifty preliminary products and technologies which can be used to produce chemical weapons. There has been considerable progress in this area, but much work remains to be done. In particular, the policies of the countries of Eastern Europe need to be harmonized with those of the Australia Club. Furthermore, guidelines have to be developed in regard to countries that do not adhere to any export standards, such as Brazil or China.

Ms. Harris discussed the question of sanctions. Suppliers and purchasers of chemical weapons should be punished, she said, by international embargoes and other methods prescribed by international law. Consideration should also be given to punishing those who engage in gas warfare through diplomatic and economic measures. In 1988, President Mitterrand proposed a full embargo on high technology and arms against those who employ chemical weapons. Presidents Bush and Gorbachev came out in favour of such sanctions in 1990. The United States is prepared to consider the use of chemical weapons as "an extremely serious infringement of international law," and legislation requiring obligatory sanctions in such cases should be voted on this year. This poses problems in the negotiations on CWC because the great powers refuse to be bound by obligatory international sanctions. However, the Security Council or the General Assembly could play a greater role by warning potential users and by imposing sanctions if such weapons are employed. Ms. Harris spoke about a less well-known aspect of efforts to stop the proliferation of chemical weapons, namely assistance for victims of chemical attacks. If the international community guaranteed the provision of detection, protection, decontamination and medical services, potential users would be forced to revise their calculations on the advantages of gas attacks. Countries with chemical weapons would also hesitate to use them if the victims of chemical attacks were guaranteed military protection.

Finally, Ms. Harris spoke about controlling armaments. The future CWC would not solve all problems, but it would succeed in "de-legitimizing" chemical weapons. She also warned against relying too much on a regional approach to arms control (for instance in the Middle East), instituted even though the basic political problems had not been resolved.

Gordon Vachon of the Department of External Affairs spoke again, this time as an analyst, making numerous informative comments about the presentations. He expressed his doubts about the description of the Australia Club as a suppliers' club. It was, he said, an informal group created after Iraq resorted to gas warfare, but several important suppliers were not members. Mr. Vachon also maintained that the industry's reluctance to accept export controls should not be exaggerated. It was true that the industry had

never shown much concern about the question of chemical weapons and that it was government experts on arms control who had first raised the matter. However, the industry was undergoing an education process. With regard to export controls, Mr. Vachon pointed out that they had other advantages in addition to increasing the amount of time and money needed to acquire arms of mass destruction. In particular, such controls made the efforts of potential proliferators more obvious because they had to deal with large numbers of suppliers and intermediaries in their efforts to evade the restrictions, and their activity increased the likelihood of detection by intelligence services. Mr. Vachon also wished to draw attention to a little-known negative effect of export controls: government officials were being overwhelmed with excessively long lists of controlled goods. He pointed out that the philosophy of export controls had changed in the last two years. While the previous practice had been to draw up lists of controlled products, the new practice was to employ the principle of "illustrative" lists. Furthermore, British and American legislation contained general provisions obliging companies, if notified by the government that their products could be used to manufacture weapons, to automatically request export permits for their products, equipment and know-how. Finally, Mr. Vachon warned that linking chemical to nuclear disarmament would not make the latter any more likely but would further complicate the former.

Discussion: Ms. Harris and Mr. Vachon reiterated their reservations about regional negotiations. The Mubarak proposal (to ban weapons of mass destruction from the Middle East) was a fine initiative and a compromise on the part of the Arabs; however, several Arab countries, including Egypt itself, had not made any specific commitments in this regard, when for example they could have ratified the Biological and Toxin Weapons Convention (BTWC). A participant asked if napalm and gas explosives should be considered chemical weapons. Mr. Vachon pointed out that the accepted definition of chemical weapons was that their main impact stemmed from their toxicity. There was still some question about whether defoliants and irritant gases were included, but the weapons mentioned by the participant clearly were not. Another participant referred to the difficulties experienced in controlling the export of chemical technologies because of their dual-purpose nature. Ms. Harris maintained that there was no difficulty managing the

controls thanks to the classical procedure of requiring companies to obtain export permits in certain cases, as well as requiring the government to seek advice from several quarters before deciding whether to grant the permits. The question of destroying chemical weapon stockpiles was also addressed. Both participants said they were quite optimistic in this regard. Mr. Vachon said that it would not cause any particular problem even if the destruction of American and Soviet arms were not completed in ten years because they would then be transferred to the custody of the future World Chemical Disarmament Authority. In addition, industrialized countries such as Canada and the United States had offered to share their destroying techniques with other countries which so requested.

Biological Weapons

Erhard Geissler of the Central Institute of Molecular Biology in Berlin said that there was still a threat from biological weapons despite the prohibitions on biological warfare going back to the Geneva Protocol of 1925 and the prohibition on biological weapons in the 1972 Convention. First, sixty countries, including most of the countries in the Middle East, have not yet signed BTWC. Second, only a handful of countries have adopted the provisions of the Convention in their own legislation, as required by Article IV. Even Canada has not taken this step, despite its particular contribution to the control of biological exports. Political disputes in the Third World also contribute to the proliferation of biological weapons. Unlike some other experts, including Julian Perry Robinson, Geissler believes that chemical and biological weapons can have a powerful deterrent effect in the Third World. Iraq acquired these arms by procuring certain technologies in the West, especially in the Federal Republic of Germany. Reports of UN inspectors will soon reveal the extent of Iraqi research in this area. Since 1972, the threat from biological weapons has had to be re-evaluated because of advances in genetic engineering. New techniques of genetic manipulation have stimulated research for defensive purposes, as authorized by the 1972 treaty, although this research is also related, according to Mr. Geissler, to the development of offensive arms. The danger of releasing hazardous pathogenic agents into the environment has also increased. The development

of vaccines has been stimulated as well. This boosts the offensive capability of some countries by ensuring that their populations and troops could be protected if they decide to attack using certain agents.

The 1972 Convention cannot prevent this in any way because it does not proscribe defensive research into biological weapons and it guarantees that protective technologies will be transferred to Third World countries. In addition, the statutes of the World Health Organization (WHO) guarantee all countries access to any agents or vaccines useful for the protection of public health. The 1972 Convention needs to be strengthened. In any case, the only members that have exchanged information so far are the most industrialized countries.

The proliferation of biological weapons cannot be prevented by controlling exports because the products and equipment needed to manufacture such weapons are also needed for civilian research. Open transactions should be encouraged. According to Mr. Geissler, exporters of agents and technologies with potentially pathogenic applications could be required to register their shipments with an international monitoring agency. The recipients of these shipments would be required to register the source and the intended purpose. Mr. Geissler also said that successful international cooperation in the eradication of smallpox should inspire us to create an international programme at WHO for the development and use of vaccines. Such a programme would benefit public health in general, and would also produce interesting spin-offs in the area of non-proliferation. It would build confidence, provide proof of compliance, encourage observance of Article X, and increase the attractiveness for Third World countries of signing BTWC.

Susan Wright of the University of Michigan said that research in genetic engineering was mainly responsible for the resurgence of the threat from biological weapons in the 1980s. Research for defensive purposes, allowed under the Convention and carried out by the great powers, was having a harmful effect on the control of biological weapons, according to Ms. Wright. Such research was a provocation in the eyes of other powers which feared biological attack by countries able to protect their own populations. The argument that the great powers needed to protect themselves against possible

biological attack was unjustified, according to Ms. Wright. A kind of biological Strategic Defence Initiative was just as illusory as its nuclear missile prototype. The continuation of "prophylactic" research in countries in the North, together with the campaigns mounted by some countries in the South to obtain arms of mass destruction, constituted the main danger to the future of BTWC.

Ms. Wright then spoke about methods of strengthening the Convention, such as confidence-building measures and monitoring procedures. She proposed that a memorandum of understanding be adopted forbidding certain activities even in the area of research for defensive purposes. She also spoke about measures to restrict supply which should be integrated into the overall effort to prevent the proliferation of biological weapons. There was always some risk that these measures would have the negative effect of encouraging some countries to join together in order to produce biological weapons, but selective embargoes could be applied on the export of certain pathogenic agents to non-signatory powers suspected of conducting research into biological weapons. The terms of such embargoes could be defined by the signatories of the treaty and would make it possible to resolve the dilemma posed by the co-existence of Article III (forbidding the transfer of biological weapons) and Article X (guaranteeing full peaceful cooperation). Perhaps this would induce other countries to subscribe to the treaty. Ms. Wright thought, however, that it was still incumbent on the great powers to set a good example by reducing or even eliminating their biological research.

John Barrett, a member of NATO's Political Affairs Division, observed that both presentations put the emphasis on reducing demand rather than supply. Policies aimed at controlling supply were interim measures, short-term impediments with limited effectiveness because there was no guarantee that countries would participate and because the targeted countries could attempt to circumvent the embargoes by turning to the black market or acquiring their own equipment for constructing biological weapons. Mr. Barrett said that it was not out of the question that the industrialized countries would create a cartel of exporters of biological products similar to the Australia Club. However, they would have to agree on a list of technologies and pathogenic agents to be

controlled -- a rather difficult task. Mr. Barrett also took the opportunity to defend Canada's position with regard to two points in the 1972 Convention. Canada considered that the adoption of special legislation to meet the requirements of Article IV was pointless because the Criminal Code already provided sufficient punishment for anyone who violated BTWC. Second, Canada favoured allowing research for defensive purposes, as allowed by Article I, because it believed that the support of most countries for the treaty was conditional on this clause.

Discussion: Several participants expressed their agreement or disagreement with the opposition of the speakers to conduct research for defensive purposes. Mr. Geissler sought to propose a compromise position by reiterating his suggestion that civilian research into vaccines be allowed under international supervision. The question of the lack of Canadian legislation on biological weapons was also discussed. Again Mr. Geissler attempted to build bridges between the participants by suggesting that at the next conference for revising the Convention, the Canadian delegation should distribute information explaining its position. Controls on the exchange of scientific information and the responsibility of scientists to keep dangerous information secret, were also discussed.

V COMMAND AND LAUNCH SYSTEMS

Two conference sessions were devoted to military systems that are directly related to weapons of mass destruction: missiles and command, control, communication and information systems (C^3I).

Intermediate-Range and Intercontinental Missiles

Aaron Karp of SIPRI said that the new international order was the guiding principle underlying all the presentations at the conference. He chose to speak about the role of the missile technology control regime (MTCR) in the new international context. He believed that MTCR, despite its faults, had succeeded in slowing missile proliferation.

The basic principles of MTCR were the following:

- The system was based on the belief that the proliferation of ballistic missiles was destabilizing because these arms intimidated other countries which then felt obliged to acquire such missiles themselves. (The delivery of missiles to Israel by the United States was an exception to the regime and puzzling for advocates of non-proliferation.)

- "Rising" military powers did not have the right to acquire missiles. This rule was unfair, of course, because it upheld the Western concept of the international order over the claims of other nations to do what they wished, but it was nevertheless necessary in order to avoid wars.

- Suppliers of missiles needed to be willing to forego profits for the sake of international security. Once again, this rule was contested, especially by new producers.

- There were limits on export controls because technology transfers that were in the legitimate economic interests of a country could not be blocked.

- A new principle was emerging according to which anti-tactical ballistic missiles (ATBMs) were an acceptable part of non-proliferation efforts so long as they did not undermine the 1974 Treaty on anti-ballistic missiles (ABM Treaty), which forbade the deployment of defensive systems against intercontinental missiles.

All in all, MTCR had been more successful than anyone thought when it was created. At the time, the United States estimated that fifteen to twenty Third World countries possessed the means to build intermediate-range or intercontinental missiles by the year 2000 on their own. Now it seemed that only two or three would do so. The ability to manufacture one's own missiles was therefore not as important to proliferation as the ability to purchase them.

How should the success of MTCR be explained? 1) Ballistic missiles have proved more difficult and expensive to develop than originally believed. 2) External threats to various countries in the Third World have diminished. 3) Efforts at non-proliferation have been successful so far. Nevertheless some people still criticize MTCR, though from opposite points of view. First, there are American "hawks" who speak constantly about the failure of MTCR because they want to raise the spectre of Third World missiles reaching the United States in order to justify the building of an anti-missile defensive system. Then there are Third World critics, led by India, who complain that the system is unfair.

Mr. Karp formulated some ideas about limiting the proliferation of missiles. First, some new producers need to be induced to sign MTCR, especially China and North Korea. He is optimistic because he thinks that these countries will soon understand, like Western countries before them, that missile proliferation is not in their national interest. Second, export controls need to be better managed. Mr. Karp thinks that responsibility for this area should be transferred from departments of trade, which are more likely to

find themselves torn by conflicts of interest, to departments of defence, which are more sensitive to security concerns. Mr. Karp called for tighter controls on intermediate-range and intercontinental missiles, even if that entails abandoning short-range missiles, whose proliferation can no longer be stopped in any case. Mr. Karp said he was skeptical about the benefits of a regional approach, which would lead nowhere so long as the political problems underlying regional conflicts are not resolved. He also doubted that a world treaty banning missiles would be signed some day. Negotiations of this type were complicated by the lack of consensus on the present distribution of ballistic capabilities within the international system. In addition, there was little propensity among the antagonists to cooperate with one another, and the disparities in ballistic forces were too pronounced to permit agreements like the great US-Soviet accords.

In conclusion, Mr. Karp said that missiles were still a symbol of prestige which one should attempt to delegitimize. He congratulated Canada for having proposed a world summit on instruments of war and weapons of mass destruction. He said that ballistic missile tests should be banned and hoped that the superpowers would one day ban ground-based ballistic missiles. In conclusion, Mr. Karp repeated that very few Third World countries were involved in threatening programmes to develop missiles. Non-proliferation efforts could therefore be effective because they could focus on these cases in particular.

In contrast to Mr. Karp, **Kathleen C. Bailey**, of the National Institute for Public Policy maintained that measures to restrict supply would not solve the missile proliferation problem. Unlike the case in the nuclear area, the products needed to construct missiles were dual-purpose and it was therefore very difficult to prevent their spread. The acquisition of Chinese missiles by Saudi Arabia, the improvements made to SCUD missiles by Iraq, Iran and North Korea, the development of AGNI by India, the existence of a South African missile and Israel's launch of a missile into space clearly demonstrated the failure of MTCR. Furthermore, Ms. Bailey thought that Argentina's CONDOR programme, whose termination had been attributed to international pressure, was not really dead; it had simply been concealed by transferring it from the air force to the

space agency. According to Ms. Bailey, new producers, especially China, would continue to sell missiles all over the world. The inherent problems in missile export controls would mushroom when the Third World became seriously interested in cruise missiles, a development which should not take long because stations for receiving the Global Positioning System (GPS),[4] which were becoming increasingly sophisticated and inexpensive, could be used to operate rudimentary cruise missiles. These missiles could penetrate any air space without being detected and escape defensive missiles.

According to Ms. Bailey, we should opt instead for policies that aim to reduce the demand for missiles and are directed in particular at conflict resolution, providing security guarantees on the part of the great powers, and achieving arms limitation agreements. She thought that in the first two cases it was difficult to devise successful policies at present but that there was some hope of signing an international treaty like the Intermediate Nuclear Forces Treaty (INF) signed by the United States and the USSR in 1987. This was a model agreement because it targeted the types of missiles which we wanted to eliminate and its implementation was subject to monitoring. An international treaty on INFs would not result in any discrimination between North and South and could be adopted fairly quickly because its basic provisions had already been negotiated between the United States and the Soviet Union. In short, this treaty would eliminate all intermediate-range missiles (500 km to 5,500 km), ban tests of missiles with a greater range than 500 km and of ground-based cruise missiles, and encourage the adoption of confidence-building measures and supplementary agreements.

Paul Buteux of the University of Manitoba said that he agreed at one and the same time with the clashing views of the two previous speakers. He agreed with Mr. Karp that the threat from missiles was exaggerated and that more could be done than was thought possible a few years ago to reduce the threat. By the same token, he agreed entirely with Ms. Bailey that solutions other than simply controlling supply should be

---

[4] System that uses data from twenty-four satellites to determine the position of a receiver situated anywhere on earth, within a margin of error of less than 100 m.

emphasized in order to stop the proliferation of missiles. In addition, he had two brief comments on various aspects of the presentations. In reference to Mr. Karp, he maintained that transferring responsibility for export controls from departments of trade to departments of defence might not be such a good thing. The bureaucrats in departments of defence, he thought, would broaden the definition of "military products" to such an extent that the cost of controls would increase substantially. Mr. Buteux also cast doubt on Ms. Bailey's claim that cruise missiles would be easier to develop than ballistic missiles.

Discussion: The failure of the USSR to join MTCR, despite expressions of interest in their doing so, was discussed. The Soviets were reluctant at first because they did not wish to share their secrets. Recently American enthusiasm for Soviet participation seemed to have waned. Ms. Bailey said that the United States still perceived the Russians as reluctant and reminded the audience that the other signatories of MTCR must approve Soviet participation. Mr. Karp observed that the Soviets had supported MTCR's objectives in two joint declarations with the Americans in 1990, and were in fact applying MTCR export rules. Their signature was therefore desirable, he said, but would not actually change very much.

One participant said that some countries did not want to sign an INF accord because they wanted to build missiles. Ms. Bailey replied that the success of INF showed that universality was not absolutely essential for disarmament agreements. Another participant asked Mr. Karp if he did not think that the problem of missile proliferation was essentially a problem of nuclear proliferation. In other words, if NPT were universally accepted, would MTCR still be necessary? Mr. Karp replied that nuclear warheads certainly posed the greatest danger in regard to missile proliferation, but that missiles also posed a conventional threat. In any case, MTCR would be needed to prevent the sale of missiles to countries that were suspected of building a nuclear arsenal. Ms. Bailey was asked if she thought that MTCR should be dismantled. She replied that this was impossible because the Western countries were eager to retain it, but that it would

collapse on its own because, paradoxically, the invitations to all the proliferators to join were in fact an implicit recognition of its failure.

C^3I Systems

Bruce Blair of the Brookings Institution said that it was difficult to say exactly what command, control, communication and information (C^3I) systems were. The work that he and others had done on the subject dealt primarily with the nuclear force command systems of the US and USSR. The question had not been studied very much in relation to the Third World, but probably should be. After the invention of the nuclear bomb and the development of ballistic missiles, the creation of C^3I systems constituted the third great revolution in modern armaments. Mr. Blair thought that several useful lessons could be drawn from the Soviet and American experiences in this area, but he doubted that it was possible to limit the export of C^3I technologies.

Mr. Blair drew important lessons from the experiences of the superpowers. First, since C^3I systems were vulnerable to attack by only a small number of nuclear weapons, it was essential for nuclear powers to integrate their command systems and armaments in such a way as to reduce the reaction time to enemy attack as much as possible. As a result, nuclear powers had to: 1) be able to detect rapidly their adversary's intentions, especially by using reconnaissance satellites; and 2) be on their guard against accidental launchings. This last point was vital. The Americans and Soviets had needed forty years to reach their present security levels.

Mr. Blair said that nuclear forces in the Third World did not have access to detection and control systems to ensure nuclear stability. The superpowers should encourage new nuclear powers to acquire such systems. The export of C^3I systems was necessary for security, Mr. Blair continued, and in any case it was doubtful whether it could be prevented, even if we wished to do so. Control and communication systems were based on essentially dual-purpose electronic technologies. There were large numbers of

suppliers and it would be impossible to monitor transfers adequately and prevent diversions. Supercomputers were perhaps an exception, but the capacity of ordinary computers was increasing so fast that the mass-produced machines of the future would be able to perform the same calculations as present supercomputers. Export controls in this area were therefore only effective in the short run. In the end, it was better to devote our energy to limiting exports of missiles and of weapons of mass destruction.

The session commentator, **David Cox** of Queen's University, like Mr. Blair thought that the question in regard to C^3I systems was not so much whether it was possible to restrict exports, but whether it was even desirable to do so. He also warned against comparisons between the Third World and the superpowers. The United States and the Soviet Union had made many mistakes, he said, run many risks and wasted vast amounts of money before reaching their present levels of prowess. Even the other nuclear powers, such as France and Great Britain, were far from possessing the detection and communication capabilities of the superpowers. Mr. Cox said that export control measures took on different significances depending on the situation; sometimes they served the supplier countries (as in the case of missiles where MTCR was applied unilaterally and benefited the security of Western countries) and sometimes they served both suppliers and purchasers (as in the case of weapons of mass destruction). Agreements to control C^3I systems should be aimed at strengthening the security of both suppliers and purchasers.

Discussion: One audience member said he favoured sharing C^3I systems with the Third World in order to help provide stability in crisis situations. Mr. Blair emphasized that he only favoured this policy when it was absolutely clear that a particular country possessed operational nuclear weapons. Another participant wondered whether the proliferation of C^3I systems -- which were vulnerable to nuclear attack -- for commanding conventional forces might tend to stimulate nuclear proliferation among potential adversaries which would be tempted to acquire a first strike capacity. Mr. Blair answered that C^3I systems for classical arms were generally less centralized and vulnerable than those for nuclear arms. In addition, as the Americans had demonstrated against Iraq, conventional weapons could also be used to destroy C^3I systems. One could not say

therefore that there would be a causal connection between the spread of C^3I systems and nuclear proliferation. Another participant warned that encouraging the export of detection and control systems to proliferators could help to legitimize the possession of nuclear devices. In this regard, Mr. Blair thought that there was a need, apart from political considerations, to acquire such systems in order to make nuclear arsenals more secure and that this need should be met.

CONCLUSION

It is impossible to do justice to the enormous contributions of all those who took part in the conference. We shall therefore have to content ourselves with mentioning only a few of the mostly frequently expressed conclusions over the three days. They will bear witness in future to the state of mind of observers of arms control in the period immediately following the end of the Cold War and the war against Iraq.

Most experts agreed that controlling arms proliferation through limits on supply was only one aspect of a much broader struggle against regional conflict and excessive armament. All acknowledged that controlling supply was not the definitive solution to problems of peace and security. Some participants maintained that the Western countries had paid too much attention to controlling supply, to the detriment of other aspects of the problem. A few even said that controlling supply was only a secondary aspect of overall arms control, from which not too much should be expected because its effectiveness was limited and it complicated relations with the Third World. No one, however, argued that the disadvantages of controlling supply were so pronounced that it should be totally abandoned. Similarly, no one espoused the argument of the proliferators that countries have a right to acquire whatever arms they want.

Despite their divergences, the participants agreed that limiting arms transfers could have positive effects, at least for some categories of devices and in the short term. In his address (see Appendix A), De Montigny Marchand provided a good description of the impact of measures to limit supply when he said that they were especially valuable as a short-term measure (while waiting for more complete disarmament accords) and as an insurance policy to reinforce the effect of international law. The participants differed in their opinions of export controls on missiles and C^3I systems, but they generally agreed on the necessity for some controls on nuclear and chemical exports.

Views also varied on the feasibility of supply controls. All thought that, in the long run, scientific and technical knowledge would spread, putting sophisticated Western arms

within reach of all the poor countries. However, the participants disagreed on the possibility of restricting transfers. Most thought that this approach would produce acceptable results in the nuclear field. Views varied, however, in regard to other fields. For example, many doubted that it was possible to control flows of conventional weapons.

Those who favoured controlling transfers felt that certain deficiencies were evident. First, national export policies need to be strengthened, especially in regard to sales of conventional weapons. These sales are still often based entirely on the economic and political interests of the supplier, without any consideration of deeper moral questions or of the broader international interest. Some Western countries have undertaken to reform their laws on strategic exports. The countries of Eastern Europe are blank sheets in this regard and need to formulate legislation. It is to be hoped that Third World countries will emulate them. The cases of Eastern Europe, Argentina, Brazil and South Africa seem to indicate that the change to political democracy has a positive effect on controls as well.

Finally, the administration of controls needs to be improved. Too often, governments have failed to devote enough resources to the process for authorizing export permits, with the result that dangerous products have escaped the attention of the authorities and fallen into the wrong hands. Furthermore, conflicts between various segments of the bureaucracy over responsibility for this area have not always been resolved in the best interests of improved control over exports.

International cooperation also needs to be strengthened. All suppliers should apply multilateral agreements with equal vigour. Confidence-building measures should be taken to ensure that some suppliers do not pursue highly profitable trade in strategic goods while others adhere strictly to collective agreements.

Suppliers should pay more joint attention to intelligence gathering. Many panelists referred to the inadequacy of our knowledge about the dangerous designs of Saddam Hussein or Kim Il Sung. This is an area where the secret services appear to have failed and where they should focus more attention as quickly as possible.

There were often clashes on our panels between advocates of regional and global approaches to controlling supply. According to the former, regional arms control agreements should be signed first, involving as much as possible both suppliers and purchasers. The Middle East was the first area where this approach should be taken in parallel with other confidence-building measures. Proponents of a global approach opposed this, maintaining that no progress could be made toward regional arms control until the region's underlying political problems had been solved. According to them, the primary emphasis should be placed on limiting and de-legitimizing the most dangerous weapons through the adoption of international treaties and measures to control transfers.

The champions of both approaches agreed that the UN should play a larger role in limiting exports of arms and strategic products. Resolution 687, requiring the dismantling of Iraq's weapons of mass destruction, was welcomed by some as a positive precedent, ushering in an enhanced role for the Security Council. Some participants suggested that the UN should play a role in evaluating threats of proliferation, drawing up lists of controlled products, and monitoring international agreements in this area.

Many participants emphasized that the disarmament of the great powers could contribute substantially to attempts to control trade in strategic products. If Third World countries were expected to support export controls and non-proliferation, the great powers would have to set a good example by renouncing some parts of their arsenals. This had basically been done in the areas of chemical and biological weapons, but progress was still needed in the nuclear and conventional areas.

According to Stephanie Neuman, the following question should be asked before undertaking any serious arms control policy: is this being done in the interests of the Western nations or in the interests of all nations? Much ambiguity remained in this regard. The conference had been a success from many points of view, but this question had not been directly addressed. Perhaps it could be assumed that, in the eyes of some, Western interests in this regard were automatically compatible with those of the rest of

the world. The Canadian government seemed to adopt this point of view, but many Third World countries did not, fearing that export controls threatened their military security and technological development. This then was a subject which deserved further consideration after the deliberations here on controlling the supply of weapons.

APPENDICES

A SUMMARY OF THE CLOSING ADDRESSES TO THE CONFERENCE

De Montigny Marchand

The Under-Secretary of State for External Affairs said the main lesson of the Gulf war was that the proliferation of weapons of mass destruction and the accumulation of excessive amounts of conventional weapons were dangerous and destabilizing and must be eliminated. This lesson was not really new, but the Gulf war had highlighted it once again. Mr. Marchand added that the government was fully aware that Canadians were willing to contribute to the war effort in the Gulf, but only on condition that steps were taken to ensure that such a situation did not arise again. For this reason, the Prime Minister and the Secretary of State for External Affairs announced on 8 February an initiative to mobilize the international community on the non-proliferation issue. Mr. Marchand then spoke about Canada's recent efforts in the areas of missiles and of nuclear, chemical, biological and conventional weapons. He also mentioned the government's recent initiatives at such multilateral bodies as the Organization of American States, NATO, the Conference on Security and Cooperation in Europe and the Group of Seven.

Mr. Marchand discussed Canada's position on attempts to check the arms race by limiting supplies. Controlling supply is the first means of defence against proliferation. It is not an ideal solution, but we do not live in an ideal world. In order to combat proliferation we must think, while preserving our ideals, of the concrete measures that can actually be taken and controlling supply is one of the measures that can be achieved at the present time. When no diplomatic instruments exist to proscribe certain weapons, export controls constitute an essential provisional measure. Even when there are such instruments, measures to control supply are needed to prevent transfers to countries that have not signed the treaties. In addition, export controls guarantee that international undertakings will be observed.

However, supply controls are short-term measures which make it possible to gain some time but which cannot deliver all the advantages of multilateral diplomatic agreements. The Canadian action programme for controlling weapons therefore comprises both measures for controlling supply and more far-reaching measures. Canada believes that we should gradually move away from supply control systems as international agreements are worked out.

Canada also believes that suppliers and purchasers of high-tech items should work together to define the limits of exchanges in this area. Canada is particularly interested in the proposal which Argentina and Brazil presented this year to the UN Disarmament Commission on setting forth standards regarding the transfer of secret technologies which could receive common consent. Canada recognizes the right of other countries to have access to various technologies, but it does not believe in an absolute right. Some countries claim that they will act in a responsible way if they are provided with the latest technologies, but we ask them to demonstrate that they are responsible before we supply what they want.

Mr. Marchand concluded by alluding to the historic opportunity created by the war with Iraq to reach agreement on arms controls. He said he was convinced that there would be tangible and lasting results.

Paul Warnke

Mr. Paul Warnke is well known as the American negotiator of SALT II and as the former director of the Arms Control and Disarmament Agency. It was important, he thought, to recognize the errors that had led to the Iraq crisis. Too often the United States and its allies had overarmed other countries, thinking that they were warding off their enemies. However, this practice had rebounded upon them, especially in the cases of the fall of the Shah of Iran and the rise of Saddam Hussein.

According to Mr. Warnke, the United States could take the initiative in limiting conventional arms by announcing a six-month moratorium on arms sales to the Middle East. This would be a good prelude to the meeting which the five principal suppliers of arms to the Middle East were supposed to hold in Paris in July. The United States should also suggest to the five leading powers that sales to the Middle East be reduced by half in order to stabilize them at early 1980s levels. The big five should also agree that the materiel and weapons taken out of service under the CFE1 Treaty would not be sold abroad. Mr. Warnke also advocated openness in the arms trade. He welcomed President Bush's initiative to ban transfers of fissionable materials to this region, though he maintained that this must be universally applied.

There were several reasons to hope that arms purchases would decline, according to Mr. Warnke. One major cause of excessive armament, namely the East-West rivalry, had melted away. American military expenditures were therefore likely to decline by fifty percent by the end of the century. The arms industry was well aware of this and was planning accordingly. The West no longer wanted to expend vast amounts of money on arms and realized that conversion of the arms industry would bring economic benefits.

The arms trade was also likely to diminish in the future because it was no more in the interests of the rich countries than of the poor countries.

Lieutenant-General Mikhail Milstein

Lieutenant-General Mikhail Milstein is a special advisor in the Institute of USA and Canadian Studies at the Academy of Sciences in the USSR. For many years he taught at the General Staff Academy. He said that transfers of conventional arms could pose a serious threat to international security in the future. It was a very complex question because it had political, military and economic aspects and also affected relations between the North and the South, the South and the South, and the Soviet Union and the United States.

Despite all the efforts to control the arms trade and the end of the Cold War, it would not prove possible to stop the arms trade because of various political factors such as continuing instability in the South. Worldwide political and economic measures needed to be adopted in order to resolve this problem. The end of the East-West conflict must not be allowed to precipitate an intensification of South-South or North-South conflicts.

Lt-General Milstein drew attention to the need to do something about the thousands of sophisticated arms that have been withdrawn from the European theatre and are available to be sold abroad. Furthermore, we should be careful not to draw all too easy lessons from the war against Iraq. It has left the Middle East in the same condition as before, and arms sales there will continue.

The main deficiency in the struggle against nuclear proliferation is the lack of information about the programmes of proliferators. According to Lt-General Milstein, much remains to be done in this area.

In conclusion, he emphasized that it would be impossible to establish an international order so long as large-scale weapons sales continue.

Tahsin Bashir

Tahsin Bashir works at the National Centre for Middle East Studies in Cairo. Among other things he has been an adviser to President Nasser, an Egyptian delegate to the Arab League, and ambassador to Canada. Mr. Bashir said that he favoured some export controls but believed that emphasis should be given to policies aimed at resolving conflicts.

Like some other speakers, he drew lessons from the war against Iraq. First, he said it demonstrated the complete failure of intelligence services which proved unable to

foresee Saddam Hussein's actions or to evaluate his potential for mass destruction. Furthermore, the Iraq crisis would prove to be a unique event because the constellation of conditions that allowed collective security principles to be implemented would not be repeated.

Controls on trade in sophisticated arms would not suffice in themselves to prevent either destabilization or war in the Third World because enormous massacres could be inflicted with simple arms, and would-be arms purchasers could always find supplies on the black market. Mr. Bashir thought that attempts to control supply represented a rather mechanical solution that failed to address the basic causes of conflict.

However, despite his reservations, Mr. Bashir favoured controls on exports to the extent that they helped to rationalize the transfer and deployment of arms. This would be a useful process in the Middle East. Export controls would also be helpful if they were aimed at a certain country in the region that was always exempted from limitations on the transfer of modern weapons from the West.

Mr. Bashir commented further on the UN's role in arms control. He said that its intelligence gathering and analysis capabilities could be improved, for example if the Secretary-General were allowed, as was the case in the League of Nations, to hire experts without first consulting the member states. The UN should also have an agency in charge of monitoring whether arms limitation agreements were actually being upheld.

Finally, the ambassador emphasized the importance of establishing a process for resolving the conflicts in the Middle East and for combatting the real enemies of peace such as overpopulation and poverty.

B AGENDA

THE SUPPLY-SIDE CONTROL OF WEAPONS PROLIFERATION

A Conference organized by the
Canadian Institute for International Peace and Security
19-21 June 1991
Ottawa, Canada

Wednesday, 19 June 1991

9:00 Welcome speech: **Bernard Wood**, Chief Executive Officer, Canadian Institute for International Peace and Security

9:15 **The proliferation of weapons in the 1990s: the lessons of Iraq**

Speaker: **Lewis Dunn**, Science Applications International Corporation, USA
Speaker: **Sergei Rogov**, Institute of the United States and Canada, Academy of Sciences, Soviet Union
Discussant: **Mark Heller**, CIIPS, Canada
Chairperson: **Bernard Wood**, CIIPS, Canada

10:30 Break

10:45 **New producers of weapons and dual-use technologies: the main threat to supply-side restraints?**

Speaker: **Renato Dagnino**, State University of Campinas, Brazil
Speaker: **William C. Potter**, Monterey Institute of International Studies, USA
Discussant: **Harold Klepak**, Royal Military College, St.-Jean, Canada
Chairperson: **Georges Hénault**, Institute for International Development and Cooperation, Canada

12:15 Lunch

14:00 **Trends in the production and trade of conventional weapons**

Speaker: **Michael T. Klare**, Hampshire College, United States
Speaker: **Keith Krause**, York University, Canada
Discussant: **Jim Fergusson**, University of Manitoba, Canada
Chairperson: **Robert Cameron**, CIIPS Board of Directors, Canada

15:30 Break

15:45 **Strengthening conventional arms sales restraints: can national interests be redefined?**

Speaker: **Katarzyna Zukrowska**, Polish Institute of International Affairs, Poland
Speaker: **Stephanie Neuman**, Institute on Western Europe, Columbia University, USA
Discussant: **Ernie Regehr**, Project Ploughshares, University of Waterloo, Canada
Chairperson: **Thomas Jones**, Department of External Affairs and International Trade, Canada

17:15 End for the day

Thursday, 20 June 1991

9:00 **Trends in nuclear proliferation**

Speaker: **John Simpson**, Centre for International Policy Studies, University of Southampton, United Kingdom
Speaker: **Leonard S. Spector**, Carnegie Endowment for International Peace, USA
Discussant: **Albert Legault**, Laval University, Canada
Chairperson: **Mark Moher**, Department of External Affairs and International Trade, Canada

10:30 Break

10:45 **Nuclear export controls: can we plug the leaks?**

Speaker: **Pierre Lellouche**, Paris City Hall, France
Speaker: **Paul L. Leventhal**, Nuclear Control Institute, USA
Discussant: **Tariq Rauf**, Canadian Centre for Arms Control and Disarmament, Canada
Chairperson: **Peggy Mason**, Ambassador for Disarmament, Canada

12:15 Lunch

14:00 **Chemical weapons: preventing the spread of the poor man's atomic bomb?**

Speaker: **Julian Perry Robinson**, University of Sussex, United Kingdom
Speaker: **Elisa Harris**, The Brookings Institution, USA
Discussant: **Gordon Vachon**, Department of External Affairs and International Trade, Canada
Chairperson: **David Braide**, Chairman of CIIPS Board of Directors, Canada

15:30 Break

15:45 **The spread of biological and toxin weapons: the nightmare of the 1990s?**

Speaker: **Erhard Geissler**, Central Institute for Molecular Biology, Germany
Speaker: **Susan P. Wright**, University of Michigan, USA
Discussant: **John Barrett**, Political Directorate, NATO
Chairperson: **Robert H. Haynes**, York University, Canada

17:15 End for the day

Friday, 21 June 1991

9:00 **Missile proliferation: is the MTCR enough?**

Speaker: **Aaron Karp**, SIPRI, Sweden
Speaker: **Kathleen C. Bailey**, National Institute of Public Policy, USA
Discussant: **Paul Buteux**, University of Manitoba, Canada
Chairperson: **Dennis Snider**, Department of External Affairs and International Trade, Canada

10:30 Break

10:45 **C3I systems and regional stability: is an export regime possible?**

Speaker: **Bruce G. Blair**, The Brookings Institution, USA
Discussant: **David Cox**, Queen's University, Canada
Chairperson: **General Gerard Thériault**, CIIPS Board of Directors, Canada

12:15 **CIIPS lunch**

Speaker: **DeMontigny Marchand**, Under-Secretary of State for External Affairs and International Trade, Canada

14:00 **Roundtable: Problems and prospects of supply-side arms control**

Speaker: **Paul Warnke**, former negotiator on disarmament, USA
Speaker: **Mikhail Milstein**, Institute for the United States and Canada, Academy of Sciences, USSR
Speaker: **Tahsin Bashir**, former Presidential Advisor, Egypt
Chairperson: **Bernard Wood**, CIIPS, Canada

16:00 End of the conference

C LISTE DES PARTICIPANT(E)S / LIST OF PARTICIPANTS

NOM/NAME	ORGANISATION/ORGANIZATION	VILLE/CITY
Warren Allmand	Member of Parliament	Ottawa
Kathleen Bailey	National Institute of Public Policy	Fairfax
J.J. Bailliu	Department of National Defence	Ottawa
John Barrett	Political Directorate, NATO	Brussels
Tahsin Bashir	National Centre of Middle East Studies	Cairo
Monique Bergeron	Centre québécois de relations internationales	Québec
Bruce Blair	The Brookings Institution	Washington
Douglas Bland	National Defence College	Kingston
David Braide	Chairman, Board of Directors, CIIPS	Toronto
Paul Buteux	University of Manitoba	Winnipeg
Robert Cameron	CIIPS Board of Directors	Ottawa
Doina Cioiu	CIIPS	Ottawa
J.R. Coady	Atomic Energy Control Board	Ottawa
G.J. Cooney	Department of External Affairs	Ottawa
David Cox	Queen's University	Kingston
Renato Dagnino	State University of Campinas	Campinas
Emilio de Stefanis	Ministry of Foreign Affairs	Rome
Luis Augusto de Castro Neves	Brazilian Embassy	Ottawa
Walter Dorn	Science for Peace	Toronto
Lewis Dunn	Science Applications International Corporation	McLean
Piero Francese	Ministry of Foreign Affairs	Rome
Bill Galbraith	Solicitor General's Office	Ottawa
Erhard Geissler	Central Institute for Molecular Biology	Berlin

NOM/NAME	ORGANISATION/ORGANIZATION	VILLE/CITY
Guy Gendron	*TVA*	Ottawa
Gilbert Ghazi	Embassy of Lebanon	Ottawa
Nancy Gordon	CIIPS	Ottawa
Bernard Goulard	Université de Montréal	Montréal
Charlotte Gray	*Saturday Night*	Ottawa
Andrew Griffiths	Department of External Affairs	Ottawa
Elisa Harris	The Brookings Institution	Washington
Tim Harper	*The Toronto Star*	Ottawa
John Hay	*The Ottawa Citizen*	Ottawa
Robin Hay	CIIPS	Ottawa
Robert Haynes	York University	Toronto
Mark Heller	CIIPS	Ottawa
Georges Hénault	Institut de développement international et de coopération	Ottawa
Roger Hill	CIIPS	Ottawa
Carleton Hughes	Consultant	Ottawa
Thomas Jones	Department of External Affairs	Ottawa
Aaron Karp	SIPRI	Stockholm
Haitham Kasim	Embassy of Iraq	Ottawa
S.M.A. Khairi	High Commissioner for Pakistan	Ottawa
Michael Klare	Hampshire College	Amherst
Harold Klepak	Royal Military College	St-Jean
Keith Krause	York University	Toronto
John Lamb	Canadian Centre for Arms Control and Disarmament	Ottawa
Albert Legault	Université Laval	Québec
Pierre Lellouche	Bureau du Maire de Paris	Paris

NOM/NAME	ORGANISATION/ORGANIZATION	VILLE/CITY
Paul Leventhal	Nuclear Control Institute	Washington
Igor Liakine-Frolov	Embassy of the USSR	Ottawa
April Lindgren	*The Ottawa Citizen*	Ottawa
Andrey Loginov	Radio-Canada International	Ottawa
Deborah-Mae Lovel	High Commission for Antigua and Barbuda	Ottawa
Mary MacDonald	Queen's University	Kingston
John MacManus	Atomic Energy Control Board	Ottawa
De Montigny Marchand	Department of External Affairs	Ottawa
Peggy Mason	Ambassador for Disarmament	Ottawa
Jennifer Moher	Canadian Centre for Arms Control and Disarmament	Ottawa
Mark Moher	Department of External Affairs	Ottawa
Mikhaïl Milstein	Institute for the USA and Canada Academy of Sciences	Moscow
Paul Mooney	Canadian Press	Ottawa
Brian Mussington	Department of National Defence	Ottawa
Colin Nelson	Department of National Defence	Ottawa
Stephanie Neuman	Columbia University	New York
Luis Palma	Embassy of Chile	Ottawa
Yaacov Paran	Embassy of Israel	Ottawa
Geoffrey Pearson	Former Executive Director, CIIPS	Ottawa
A.M. Pellerin	Department of National Defence	Ottawa
William Potter	Monterey Institute of International Studies	Monterey
Ron Purver	CIIPS	Ottawa
Tariq Rauf	Canadian Centre for Arms Control and Disarmament	Ottawa
Stewart Reeves	Department of National Defence	Ottawa

NOM/NAME	ORGANISATION/ORGANIZATION	VILLE/CITY
Ernie Regehr	University of Waterloo	Waterloo
Dominique Renaux	Ambassade de France	Ottawa
Conrad Richards	High Commissioner for Antigua and Barbuda	Ottawa
Andrew Richter	Canadian Centre for Arms Control and Disarmament	Ottawa
Jean-François Rioux	CIIPS	Ottawa
Sergei Rogov	Institute for the USA and Canada Academy of Sciences	Moscow
Ahmed Said	Embassy of Egypt	Ottawa
Doug Scott	The Markland Group	Hamilton
Shannon Selin	Department of External Affairs	Ottawa
John Simpson	University of Southampton	Southampton
Boris Sirskyj	Solicitor General's Office	Ottawa
Dennis Snider	Department of External Affairs	Ottawa
Leonard Spector	Carnegie Endowment for International Peace	Washington
Paolo Spinelli	Italian Embassy	Ottawa
Venelin Stoychkov	Bulgarian Embassy	Ottawa
Mike Tachereau	Solicitor General's Office	Ottawa
Gerard Thériault	Board of Directors, CIIPS	Ottawa
Michael Thwaites	High Commission of Australia	Ottawa
Sergei Tretiakov	Embassy of the USSR	Ottawa
Ali Tuygan	Embassy of Turkey	Ottawa
Gordon Vachon	Department of External Affairs	Ottawa
Bob Vandenberg	New Democratic Party	Ottawa
John Walker	Freelance Journalist	Ottawa
Paul Warnke	Clifford & Warnke, Attorneys and Counsellors at Law	Washington

NOM/NAME	ORGANISATION/ORGANIZATION	VILLE/CITY
Rick Welbourn	CBC Radio	Ottawa
Hugh Winsor	*The Globe and Mail*	Ottawa
Bernard Wood	CIIPS	Ottawa
Susan Wright	University of Michigan	Ann Arbor
Hesham Youssef	Embassy of Egypt	Ottawa
Pat Zakaib	Office of Warren Allmand, M.P.	Ottawa
Katarzyna Zukrowska	Polish Institute of International Affairs	Warsaw

NOM/NAME	ORGANISATION/ORGANIZATION	VILLE/CITY

D LIST OF ACRONYMS

ABM (Treaty)	Anti-Ballistic Missile (Treaty)
ATBM	Anti-Tactical Ballistic Missile
BTWC	Biological and Toxin Weapons Convention
C^3I	Command, Control, Communications and Information (Systems)
CFE1	Conventional Forces-Europe, 1
CIIPS	Canadian Institute for International Peace and Security
COCOM	Coordinating Committee for Multilateral Strategic Export Controls
CTBT	Complete Test Ban Treaty (of nuclear weapons)
CWC	Chemical Weapons Convention
GPS	Global Positioning System
IAEA	International Atomic Energy Association
INFT	International Nuclear Force Treaty
LNC	London Nuclear Club
MTCR	Missile Technology Control Regime
MW	Megawatt
NPT	Non-Proliferation Treaty
PTBT	Partial Test Ban Treaty (on nuclear tests)
SIPRI	Stockholm International Peace Research Institute
START	Strategic Arms Reduction Talks
WHO	World Health Organization